

CLAIMS

1. A method for analyzing physical and/or chemical properties
5 of the surface layer of a solid comprising the activation of said surface
layer by irradiation in the form of an atom beam and/or electron beam,
and/or molecular beam and/or ion beam and/or photon beam and/or their
combination, the deactivation of the surface layer, and the recording of
the spectrum of the energy quanta emitted by the surface layer, wherein
10 the surface layer is subjected to the action of a unit radiation pulse and,
when the irradiation is over, is deactivated by keeping the solid at a
constant temperature and subsequently heating it; the spectrum of the
energy quanta emitted by the surface layer of the solid is recorded during
the deactivation; the spectrum of the emitted energy quanta recorded at a
15 constant temperature provides data on the loosely coupled states of the
surface layer and their half-lives and the thermoluminescence spectrum
recorded during the heating gives information on the phase and relaxation
transition temperatures in the surface layer.

2. The method as per claim 1, wherein the irradiation pulse
20 activating the investigated surface has the power from 10^{-5} to 10^{-3} W/cm².

3. The method for analyzing physical and/or chemical

properties of the surface layer of a solid comprising activation of said surface by low temperature plasma followed by deactivation of the surface layer and recording of the thermoluminescence spectrum, wherein the low temperature plasma with a plasma generating gas pressure from 4
5 to 8 Pa for a period from 0.05 s to 5 s is used, radiation spectra are recorded at a constant temperature of the sample, and additional information on physical and chemical reactions in the surface layer of the solid is obtained from the curves showing the decrease in isothermal luminescence from the moment the sample activation by the low-
10 temperature plasma is over.